

That which is claimed is:

1. A semiconductor package comprising:

a semiconductor wafer having an active surface comprising at least one integrated circuit, wherein each integrated circuit has a plurality of bond pads; and

at least one cured silicone member covering at least a portion of the active surface, wherein at least a portion of each bond pad is not covered by the silicone member, the silicone member has a coefficient of linear thermal expansion of from 60 to 280 $\mu\text{m}/\text{m}^\circ\text{C}$ between -40 and 150 $^\circ\text{C}$ and a modulus of from 1 to 300 MPa at 25 $^\circ\text{C}$, and the silicone member is prepared by a method comprising the steps of:

(i) printing a silicone composition on the active surface to form a silicone deposit, wherein the silicone composition comprises:

(A) an organopolysiloxane containing an average of at least two silicon-bonded alkenyl groups per molecule,

(B) an organohydrogensiloxane containing an average of at least two silicon-bonded hydrogen atoms per molecule in a concentration sufficient to cure the composition,

(C) an effective amount of an inorganic filler having a surface area less than 25 m^2/g , and

(D) a catalytic amount of a hydrosilylation catalyst; and

(ii) heating the silicone deposit for an amount of time sufficient to form the cured silicone member.

2. The semiconductor package according to claim 1, wherein the wafer further comprises streets.

3. The semiconductor package according to claim 1, wherein the cured silicone member has a thickness of from 10 to 200 μm .

4. The semiconductor package according to claim 1, wherein the concentration of

component (B) is sufficient to provide from 0.8 to 1.5 silicon-bonded hydrogen atoms per alkenyl group in component (A).

5. The semiconductor package according to claim 1, wherein the inorganic filler has surface area of from 0.25 to 10 m²/g.

6. The semiconductor package according to claim 1, wherein the inorganic filler is fused silica.

7. The semiconductor package according to claim 1, wherein the concentration of component (C) is from 100 to 600 parts by weight per 100 parts by weight of component (A).

8. The semiconductor package according to claim 1, wherein the hydrosilylation catalyst comprises platinum.

9. The semiconductor package according to claim 1, wherein the silicone composition further comprises a hydrosilylation catalyst inhibitor.

10. The semiconductor package according to claim 1, further comprising an organopolysiloxane resin consisting essentially of R³₃SiO_{1/2} siloxane units and SiO_{4/2} siloxane units wherein each R³ is independently selected from monovalent hydrocarbon and monovalent halogenated hydrocarbon groups having from 1 to 20 carbon atoms and the mole ratio of R³₃SiO_{1/2} units to SiO_{4/2} units in the organopolysiloxane resin is from 0.65 to 1.9.

11. The semiconductor package according to claim 1, wherein the cured silicone member is a cured silicone layer.

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12. The semiconductor package according to claim 1, wherein the cured silicone member is a cured silicone dome.

13. The semiconductor package according to claim 1, further comprising a metal trace having a proximal end attached to each bond pad and a distal end lying on the surface of the cured silicone member.

14. A method of preparing a semiconductor package, the method comprising the steps of:

(i) printing a silicone composition on at least a portion of an active surface of a semiconductor wafer to form at least one silicone deposit, wherein the active surface comprises at least one integrated circuit, each integrated circuit has a plurality of bond pads, at least a portion of each bond pad is not covered by the silicone deposit, and the silicone composition comprises:

(A) an organopolysiloxane containing an average of at least two silicon-bonded alkenyl groups per molecule,

(B) an organosilicon compound containing an average of at least two silicon-bonded hydrogen atoms per molecule in a concentration sufficient to cure the composition,

(C) an effective amount of an inorganic filler having a surface area less than 25 m²/g, and

(D) a catalytic amount of a hydrosilylation catalyst; and

(ii) heating the silicone deposit for an amount of time sufficient to form a cured silicone member, wherein the member has a coefficient of linear thermal expansion of from 60 to 280 $\mu\text{m}/\text{m}^\circ\text{C}$ between -40 and 150 $^\circ\text{C}$ and a modulus of from 1 to 300 MPa at 25 $^\circ\text{C}$.

15. The semiconductor package according to claim 14, wherein the wafer further comprises streets.

16. The semiconductor package according to claim 14, wherein the cured silicone member has a thickness of from 10 to 200 μm .

17. The semiconductor package according to claim 14, wherein the concentration of component (B) is sufficient to provide from 0.8 to 1.5 silicon-bonded hydrogen atoms per alkenyl group in component (A).

18. The semiconductor package according to claim 14, wherein the inorganic filler has surface area of from 0.25 to 10 m^2/g .

19. The semiconductor package according to claim 14, wherein the inorganic filler is fused silica.

20. The semiconductor package according to claim 1, wherein the concentration of component (C) is from 100 to 600 parts by weight per 100 parts by weight of component (A).

21. The semiconductor package according to claim 1, wherein the hydrosilylation catalyst comprises platinum.

22. The semiconductor package according to claim 1, wherein the silicone composition further comprises a hydrosilylation catalyst inhibitor.

23. The semiconductor package according to claim 14, wherein the silicone composition further comprises an organopolysiloxane resin consisting essentially of $\text{R}^3_3\text{SiO}_{1/2}$ siloxane units and $\text{SiO}_{4/2}$ siloxane units wherein each R^3 is independently selected from monovalent hydrocarbon and monovalent halogenated hydrocarbon groups having from 1 to 20 carbon atoms and the mole ratio of $\text{R}^3_3\text{SiO}_{1/2}$ units to $\text{SiO}_{4/2}$ units in the organopolysiloxane resin is from 0.65 to 1.9.

24. The semiconductor package according to claim 14, wherein the cured silicone member is a cured silicone layer.

25. The semiconductor package according to claim 14, wherein the cured silicone member is a cured silicone dome.

26. The method according to claim 14, wherein the step of printing is carried out using stencil printing.

27. The method according to claim 14, wherein the step of printing is carried out using screen printing.

28. The method according to claim 14, wherein the step of heating the silicone deposit is carried out at a temperature of from 90 to 200 °C for 5 to 60 min.

29. The method according to claim 14, further comprising the step of forming a metal trace having a proximal end attached to each bond pad and a distal end lying on the surface of the cured silicone member.